B. Remarks/Arguments:

Applicants acknowledge with appreciation the withdrawal of the finality of the previous Office Action. Claim 6, which recites an isolated cytotoxic T cell which specifically recognizes human sperm protein 17 (Sp17), is the only pending claim under examination in this application. Each of the grounds for which the Examiner bases the current rejections is addressed as presented by the instant Office Action.

Indefiniteness

The Examiner rejects claim 6 under 35 U.S.C. § 112, ¶ 2 for failing to particularly point out and distinctly claim the subject matter of the claimed invention. According to the Examiner claim 6 is indefinite for reciting "human sperm protein 17 (Sp17)" as the sole means of identifying the "claimed" protein that is specifically recognized by the isolated cytotoxic T cell. (*See* Office Action at p. 2). The Examiner asserts that because the specification refers to Lea et al. for identification of the protein, the claim must include a corresponding identifier that unambiguously defines the protein. (*See id.*). Applicants traverse.

First, Applicants submit that the Office's reference to the human Sp17 protein as "the claimed protein" is a misnomer. Human Sp17 is simply a protein that is recited by the claim at issue. Applicants have not now, nor ever, sought to claim human Sp17 polypeptides. Rather, Applicants' claim is directed to isolated cytotoxic T cells.

Second, the test for determining whether a claim is definite under 35 U.S.C. § 112, ¶ 2 is whether a person of ordinary skill in the art as of the application filing date would be able to

understand the language of the claim when it is read in light of the specification as filed. At the time of filing the instant application, the level of skill of a person of ordinary skill in the art of the field of invention was high. Such a person would typically possess a Ph.D. or M.D. The human Sp17 polypeptide recited by claim 6 was well known and described in the prior art at the time of filing. As disclosed in the Background section of the application, Sp17 was known to be involved in acrosome reactions in spermatozoa and was known to be a highly immunogenic protein *in vivo*. (*See* Application at p. 5, lines 9-17 (citing Lea et al. (1997)). The Detailed Description portion of the instant application consistently refers to the protein throughout as Sp17, and points the reader to a number of prior scientific articles and patents regarding Sp17, including the Lea et al. (1996) paper that lists in Figure 3B the complete human Sp17 protein sequence. (*See* Application at p. 14, lines 28-34). As previously indicated by Applicants in their response dated June 28, 2005, NCBI database accession number Q15506[1] also provides the complete and unambiguous amino acid sequence for the molecule that is referred to by those skilled in the art as "human Sp17." A second courtesy copy of the NCBI entry is enclosed herewith for the Examiner's convenience.

Finally, Applicants respectfully contend that the assertion that they have refused to unambiguously identify the antigen recognized by the claimed isolated cytotoxic T cell in an attempt to broaden the scope of the originally claimed invention is a mischaracterization of the record. (*See* Office Action at p. 4). Applicants are not claiming any Sp17 polypeptides, and the recitation of "human sperm protein 17 (Sp17)" is merely an element of the claim. Applicants are not required to place identifiers in a claim where the recited protein is already known to those of

[1] Applicants note that the Examiner was unsuccessful in retrieving any hits because the accession number Q155056 was used rather than Q15506.

skill in the art, and can be easily found in the prior art references. (*See Falkner v. Inglis*, 2006 WL 1453040, *8 (Fed. Cir. 2006). Moreover, a careful review of the prosecution history to date shows that claim 6 as originally filed is broader than claim 6 as currently under examination, which contains the added limitation of "human" Sp17. Thus, the charge that Applicants have attempted to broaden the scope of the claims as originally filed should be given no accord.

In view of the above, Applicants respectfully contend that one of ordinary skill in the art at the time the instant application was filed would have a clear understanding of the term "human sperm protein (Sp17)" and would have such a definite comprehension of the corresponding structure when read in view of the specification as filed such that the person of ordinary skill would be able to make and use the claimed invention (*i.e.*, an isolated cytotoxic T cell that specifically recognizes human Sp17) over the entire scope of the claim. Reconsideration and withdrawal of the rejection is respectfully requested.

Written Description

Claim 6 is also rejected under 35 U.S.C. § 112, ¶ 1 as lacking written description. According to the Examiner, in view of the holdings in *Eli Lilly* and *Enzo* the instant application does not adequately describe the protein product recited by claim 6, and thus, cannot adequately describe a cytotoxic T cell that specifically recognizes that protein product. (*See* Office Action at p. 7). The Examiner asserts that the specification only describes a single Sp17 (of Lea et al.) that is specifically recognized by an isolated cytotoxic T cell, and that the specification does not describe other human Sp17 proteins (such as those containing polymorphisms) that are

specifically recognized by an isolated cytotoxic T cell in a manner that satisfies either the *Lilly* or *Enzo* standards. Applicants disagree.

Applicants respectfully believe that the Examiner's reliance on *Eli Lilly* and *Enzo* are misplaced and that the holdings of those cases have been mischaracterized as applied to claim 6 of the instant application. In *Eli Lilly*, the claims were directed to recombinant microorganisms modified to encode human insulin-encoding cDNA. The court held that because the specification only disclosed rat cDNA of insulin, the claims failed for lack of written description of human insulin cDNA. *Eli Lilly* 119 F.3d at 1567. The instant application is distinguishable from *Eli Lilly* because the claimed invention does not concern the discovery of gene function or structure. Rather, the claimed invention of the instant application is focused on target recognition. Claim 6 of the instant application recites a cytotoxic T cell that recognizes human sperm protein 17, the complete structure of which was known and published prior to the filing date of the instant application.

Notwithstanding the Examiner's citation of Buchli et al. 2002 in rebuttal to Applicants' statement from the Response of March 20, 2006, *i.e.*, that Sp17 is a tissue-specific antigen (*see* Office Action at page 5), it is noted that while Buchli report on a second gene (and indicate there is a possibility of additional Sp17 species within the human genome), the corresponding protein sequence is identical to that previously disclosed by Leah et al. *See* courtesy copy of NCBI data base accession number Q15506. Thus, although Sp17 may not be tissue-specific as Applicants had believed at the time of filing, Buchli et al. 2002 in fact supports Applicants' assertion that Sp17 unambiguously refers to a known amino acid sequence that is identifiable to those skilled in the art.

The instant application can also be distinguished from *Enzo*. In *Enzo* it was reaffirmed that deposit of a physical sample may replace words when description is beyond present scientific capability. In the instant case, description is not beyond present scientific capability. The recited protein (human Sp17) is known in that art and has been characterized by several references. The existing knowledge in the field of the invention, which is akin to antibody/antigen recognition, indicates that this is a mature technology where the level of skill is high and advanced.

An objective standard for determining compliance with the written description requirement is whether the disclosure of the application relied upon reasonably conveys to persons of ordinary skill in the art that Applicants have possession of the claimed subject matter as of the date of the invention. *In re Kaslow*, 707 F. 2d 1366 (Fed. Cir. 1983) and *In re Gosteli*, 872 F.2d 1008 (Fed. Cir. 1989). Even if claim 6 of the instant application is interpreted as generic, the determination of what is needed to support generic claims to biological subject matter depends on a variety of factors, such as the existing knowledge in the particular field, the extent and content of the prior art, the maturity of the science or technology, the predictability of the aspect at issue, and other considerations appropriate to the subject matter. *Capon v. Eshhar*, 418 F.3d 1349, 1359 (Fed. Cir. 2005). Furthermore, it is not necessary that every permutation within a generally operable invention be effective in order for an inventor to obtain a generic claim, provided that the effect is sufficiently demonstrated to characterize a generic invention, for the purposes of the written description requirement. *Id.*

As noted in *LizardTech, Inc. v. Earth Resource Mapping, PTY, Inc.*, 424 F.3d 1336, 1354 (Fed. Cir. 2005), it is unnecessary to spell out every detail of the invention in the specification; only enough must be included to convince a person of skill in the art that the inventor possessed

the invention and to enable such a person to make and use the invention without undue experimentation. Applicants contend that they have set forth an invention whose scope is fully and fairly described, for the amino acid structure of the human Sp17 protein that is recognized by the isolated T cell of the claimed invention is known in the art and the content of the specification is such that one of skill in the art can generally apply the principles and specific teachings therein to achieve the isolated cytotoxic T cell as claimed even where the human sperm protein 17 may contain an as-yet-unidentified polymorphism. The existing knowledge in the field of the invention, which is akin to antibody/antigen recognition, indicates that this is a mature technology where the level of skill is high and advanced. The prior art is replete with studies of Sp17, and the human Sp17 protein itself is disclosed in several literature references and is also available at NCBI database accession number Q15506. As described throughout the specification and Example sections of the instant application, the Sp17-specific cytotoxic T cell of the claimed invention is donor-derived. As explained at page 6, lines 6-16 of the application as filed, multiple myeloma patients undergo a T cell depleted allogeneic stem cell transplantation to reduce transplant-related toxicities and graft-versus-host disease. Following donor hemapoeitic engraftment, donor-derived Sp17-specific cytotoxic T cells are administered to these patients at regular intervals to enhance graft-versus-myeloma without inducing graft-versus-host disease. *See also*, specification at p. 13, lines 12-16; p. 17, lines 9-21; Example II at p. 21; and Example III at p. 22 discussing generation and purification of Sp17 recombinant protein, *in vitro* generation of Sp17 specific cytotoxic T cells, and generation of HLA-class I restricted Sp17-specific cytotoxic T cells.

Thus, Applicants' specific teachings can be used generally to achieve an isolated cytotoxic T cell to any human Sp17 protein, because the protein is donor-derived. Presumably,

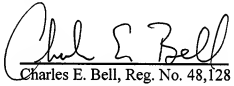
polymorphisms of Sp17 exist in the human population, as polymorphisms exist for all proteins in the human population. However, this does not change the value of Sp17 as a target in generating and isolating a cytotoxic T cell that recognizes such target. Therefore, if a donor's Sp17 protein contains a polymorphism, Applicants' invention can still be used to isolate a cytotoxic T cell that specifically recognizes that polymorphism of human Sp17. Accordingly, Applicants' invention is not merely a wish as the Examiner indicates. The claimed invention is adequately supported over its full scope and Applicants have demonstrated sufficient generality in their application to support same. Accordingly, Applicants respectfully assert that they have met their obligation to disclose the technologic knowledge upon which the claimed invention is based, and have sufficiently demonstrated that they were in possession of the invention that is now claimed. This is all that is required to meet the written description requirement under 35 U.S.C. § 112, ¶ 1. Reconsideration and withdrawal of the written description rejection is respectfully requested.

C. Conclusion

Applicants submit that this paper is fully responsive and that the application is in condition for allowance. Such action is respectfully requested. Should any questions or issues arise concerning the application, the Examiner is encouraged to contact the undersigned at the telephone number provided below.

Without an extension of time, this response is due on or before April 16, 2007. The Commissioner is hereby authorized to charge payment of any fees that may be required, or credit any overpayment of same, to Deposit Account No. 08-1935, Reference No. 0410-009A.

Respectfully submitted,



Dated: April 16, 2007

Charles E. Bell, Reg. No. 48,128
Attorney for Applicants
c/o Heslin Rothenberg Farley & Mesiti P.C.
Telephone: (518) 452-5600
Facsimile: (518) 452-5579
Customer Number 23405.